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EXAMINER	
CASCHERA, ANTONIO A	
ART UNIT	**PAPER NUMBER**
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DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/713,492	JUNGREIS ET AL.	
	Examiner	Art Unit	
	Antonio A Caschera	2676	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-13,15-21 and 23-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-13,15-21 and 23-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 2-13, 15-21, 23-28, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka (U.S. Patent 5,923,573) in view of Ardoin et al. (U.S. Patent 5,692,184).

In reference to claims 4 and 18, Hatanaka discloses modifying a "kit model" of a three-dimensional CAD system having elements such as points, curved lines and curved surfaces (see column 2, lines 7-18). Hatanaka also discloses identifying a change in an element by receiving modification information for moving or changing an element (see column 2, lines 30-32). Note, the office interprets the relationship data of Hatanaka as utilized for model regeneration as it is used in supplying a generating method to the model regeneration function (see columns 7-8, lines 66-3). Therefore the limitation of claim 4, "...creating a first step..." is interpreted as the supplying or creation of a generating method, disclosed by Hatanaka, as the generation method is defined based upon the relationship data. Further, claim 4 does not specifically point out the exact operation or use of the, "first step" and solely discloses the "first step" being based upon the structure of the first element or on a relationship between the first element and another element or elements. Hatanaka also discloses when points, curved lines and curved surfaces of

the model are moved or changed, other graphic elements which relate to the changed element are also modified (see column 7, lines 28-52). Note, that the office believes that in using such related elements as in Hatanaka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change one or more elements to produce a model that accurately reflected the change to a first element because related modified elements would cause other related elements to also be changed. Hatanaka does not explicitly disclose creating a, "second step" based on the first step and the structure of one of the elements or the relationship between two of the elements however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a second creation step in the three dimensional modeling apparatus of Hatanaka in order to provide for other related elements to be modified which are based on the modification from the first created step and because since the same basic functions as claimed is shown by Hatanaka, it is substantially a matter of designating this as a separate step. Further, the element relationship creation steps of Hatanaka could easily be repeated thus creating a plurality of steps each dependent upon modifications to related elements. Hatanaka does not explicitly disclose sorting the steps before execution. Ardoin et al. discloses an object relational management system for use in CAD software, where functions of nodes are ordered according to numeric values equivalent to comparator operators (see column 1, lines 28-31, column 8, lines 34-43 and Figure 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the sorting of elemental functions of Ardoin et al. with the modeling system of Hatanaka in order to compute functions of an element in the correct order because changing relationships could cause a change in order of

functions (see column 8, lines 54-59 of Ardoin et al.) which could lead in the modification of displayed elements (see Response to Arguments below).

In reference to claims 2 and 19, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claims 4 and 18 respectively above. Hatanaka discloses modifying a "kit model" of a three-dimensional CAD system having elements such as points, curved lines and curved surfaces (see column 2, lines 7-18).

In reference to claim 3, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 2 above however neither Hatanaka nor Ardoin et al. explicitly disclose the kit models being of an architectural structure however it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the three dimensional CAD system with many types of models including architectural models as this is a standard use for a CAD system.

In reference to claim 5, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 4 above in addition, Ardoin et al. discloses the sorting of nodes in such a manner that a parent is evaluated before the child node (see column 8, lines 36-43). Note although Ardoin et al. does not explicitly disclose the use of a depth-first search sorting algorithm the office believes such a sort, disclose by Ardoin et al., to be equivalent in functionality especially in view of the disclosed sorting process of pages 18-19 of applicant's specification whereby, parent, child, grandchild, great-grandchild etc. steps are sorted as also disclosed in Ardoin et al.

In reference to claim 6, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 4 above. Although Hatanaka discloses the generation relationship data to be included in an element's data structure (see column 7, lines 57-61), neither Hatanaka nor Ardoin

et al. explicitly disclose it being stored in a repository. It would have been obvious to one of ordinary skill in the art at the time the invention was made to store the object modification steps in a sort of memory or repository in order to repeat execution of the steps at a later time (see Response to Arguments below). Further note, all computer processes are known to be stored on some sort of readable medium which is inherently taught by the 3-D CAD system of Hatanaka, as interpreted by the office.

In reference to claim 7, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 4 above. Neither Hatanaka nor Ardoin et al. explicitly disclose one of the steps of claim 4 being a nul step however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a nul step with the three dimensional modeling apparatus of Hatanaka and the object relationship management techniques of Ardoin et al. in order to act as a, "wait" command allowing the processor to idle regeneration for a certain amount of time, which is well known in the computing art especially in computer programming (Official Notice). Further, the nul step instigating regeneration could also be broadly interpreted as a, "refresh" command whereby the display screen is redrawn which is well known in the computer graphics art (see Response to Arguments below).

In reference to claim 8, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 7 in addition, Hatanaka disclose regeneration of an object after an element is modified (see column 8, lines 62-65 and #24a-d of Figure 6). Note, although Hatanaka does not explicitly disclose the term named a, nul step, the office interprets the above step of Hatanaka functionally equivalent to the nul step of applicant's claim because in this case, when the applicant becomes his or her own lexicographer and names a certain regeneration step using the

nul term, the office interprets the functionality of the step to produce regeneration processing as disclosed by the steps of Hatanaka.

In reference to claims 9 and 17, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claims 4 and 15 respectively in addition, Hatanaka discloses each element having geometric shape data for specifying graphic elements (see column 7, lines 57-65). Note the office believes the applicant's atom feature to be functionally equivalent to the geometric shape data found in the prior art of Hatanaka. Hatanaka also discloses geometric shape data expressing a dependency between generation relationship data when geometric shape data is re-calculated by using information of the generation relationship data (see column 8, lines 6-8). Neither Hatanaka nor Ardoin et al. explicitly disclose marking changes made to an element however it would have been obvious to one of ordinary skill in the art at the time the invention was made to mark changes made to an element by saving them as new geometric shape data in order to perform further modifications based upon prior modifications.

In reference to claim 10, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 4 above. Hatanaka discloses when points, curved lines and curved surfaces of the model are moved or changed, other graphic elements which relate to the changed element are also modified (see column 7, lines 28-52). Note that the office interprets these other graphic elements, which are related to the modified element, to represent a class of elements .

In reference to claim 11, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 4 above in addition, Hatanaka discloses executing a geometry step on a structure by offsetting particular points of the structure (see Figure 16) using an F node which is associated to geometric relationship data (see column 13, lines 13-15 and column 8, lines 13-16).

In reference to claims 12 and 24, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claims 4 and 18, respectively above in addition, Hatanaka discloses geometric relationship data for each element containing an F node which includes a lock flag indicating whether or not the relationship data is locked (see column 8, lines 17-20). Note that Hatanaka does not explicitly disclose that a locked F node prevents execution however it is well known in the art that locked data is inaccessible thus disallowing the execution of code utilizing the data (Official Notice). Further, the use of such ideology is commonly used through graphics programming, for example, locking out data from computer processes using semaphores (see Response to Arguments below).

In reference to claim 13, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 4 above, however neither Hatanaka nor Ardoin et al. explicitly disclose generating an error signal if the first step or second step cannot be sorted. It would have been obvious to one of ordinary skill in the art at the time the invention was made to generate an error signal to inform the modeling system and the user of the modeling system that due to unsorted steps, elements found in the model may not be generated correctly in orientation, dimension or position. The office asserts that the generation of error signals if steps cannot be sorted would have been obvious to one of ordinary skill in the art because these steps provide essential information as to how elements are related therefore not sorting data would provide for an erroneous output or would execute redundant modeling steps. Further, generating an error signal to alert the system and/or user of such a condition is crucial and is well known in the art. Such examples of generating error signals are: displaying an error signal when performing file

operations in the Windows operating system and setting overflow flags representing errors in arithmetic processing using hardware devices.

In reference to claim 15, Hatanaka discloses modifying a "kit model" of a three-dimensional CAD system having elements such as points, curved lines and curved surfaces (see column 2, lines 7-18). Hatanaka discloses a kit model modification routine receiving element modification information and checking all elements that are effected by a modification to the element by observing a "Used list," (see column 9, lines 13-17 and 34-40). Hatanaka also discloses executing the modification of the element through the use of a model regeneration function (see column 7, lines 28-32). Note the office interprets the kit model modification routine of Hatanaka equivalent to applicant's step propagator and the model regeneration function equivalent to applicant's step executor. Also, although Hatanaka does not explicitly disclose creating a second step based on the first step and the structure of one of the elements or the relationship between two of the elements, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a second step creation in the three dimensional modeling apparatus of Hatanaka in order to provide for other related elements to be modified which are based on the modification from the first created step. Further, the element relationship creation steps of Hatanaka could easily be repeated thus creating a plurality of steps each dependent upon modifications to related elements. Hatanaka does not explicitly disclose sorting the steps before execution. Ardoin et al. discloses an object relational management system for use in CAD software, where functions of nodes are ordered according to numeric values equivalent to comparator operators by a recomputed machine (see column 1, lines 28-31, column 8, lines 10-14 and 34-43 and Figure 16). It would have been obvious to one of ordinary

skill in the art at the time the invention was made to implement the sorting of elemental functions of Ardoin et al. with the modeling system of Hatanaka in order to compute functions of an element in the correct order because changing relationships could cause a change in order of functions (see column 8, lines 54-59 of Ardoin et al.) which could lead in the modification of displayed elements (see Response to Arguments below).

In reference to claim 16, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 15 above in addition, Hatanaka discloses a data area storing a model consisting of elements, curved lines, data points and curved surfaces (see column 3, lines 20-24). Note the office interprets the applicant's element table to be inherently found within a data area such as disclosed by Hatanaka.

In reference to claim 20, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 18 above. Hatanaka also discloses when points, curved lines and curved surfaces of the model are moved or changed, other graphic elements which relate to the changed element are also modified (see column 7, lines 28-52). Hatanaka does not explicitly disclose creating a, "second step" effecting changes to the same element or based on the first step however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a second step creation in the three dimensional modeling apparatus of Hatanaka which is based on the first step in order to provide for other related elements to be modified which are based on the modification from the first created step and because since the same basic functions as claimed is shown by Hatanaka, it is substantially a matter of designating this as a separate step. It also would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a "second step" on the same element as a first step

was preformed in order to apply further modifications to an element of a design which is a standard function performed in a CAD system (see Response to Arguments below).

In reference to claim 21, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 20 above. Neither Hatanaka nor Ardoin et al. explicitly disclose creating a, "second step" selected from a plurality of steps based on the creation of other steps however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement such a second step creation in the three dimensional modeling apparatus of Hatanaka with the object relationship management techniques of Ardoin et al. in order to provide a continuing modification of elements based upon a plurality of prior changes performed by the creation of previously generated steps which is a standard function performed in a CAD system (see Response to Arguments below).

In reference to claim 23, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 18 above. Neither Hatanaka nor Ardoin et al. explicitly disclose a nul step whose execution does not affect the model however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a nul step with the three dimensional modeling apparatus of Hatanaka and object relationship management techniques of Ardoin et al. in order to act as a, "wait" command allowing the processor to idle regeneration for a certain amount of time, which is well known in the computing art especially in computer programming. Further, the nul step instigating regeneration could also be broadly interpreted as a, "refresh" command whereby the display screen is redrawn which is well known in the computer graphics art (Official Notice) (see Response to Arguments below).

In reference to claim 25, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 18 above. Hatanaka discloses the kit models prestored in a hard disk storage (see column 5, lines 6-8) representing objects using skeleton lines (see column 5, lines 28-39). Thus the office interprets the original shape of the model predicted before any modifications are preformed upon the model. Further, for example, when the user wants to modify the kit model by changing skeleton line orientations, the user must make some sort of prediction based on the kit model, as to what the modified output model should resemble. Therefore, the office believes Hatanaka inherently discloses generating the plurality of regeneration steps by prediction.

In reference to claim 26, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 18 above, in addition, Hatanaka discloses a plurality of functions contained in a table of the generation relationship data where a modifying function is chosen to be executed (see column 8, lines 8-12 and column 9, lines 57-67).

In reference to claim 27, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 18 above, in addition, Hatanaka discloses executing modifying functions contained in the generation relationship data (see column 9, lines 57-67) however neither explicitly disclose executing the steps of the first element before moving onto the next. It would have been obvious to one of ordinary skill in the art at the time the invention was made to execute the all steps of one element before moving onto the next element in such an associative modeling system of Hatanaka and Ardoin et al. in order to finish processing on an element that the next element for processing might be associated with thus allowing for all changes made in the first element to be properly carried over to the next element.

In reference to claim 28, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 18 above. The office interprets Hatanaka to inherently disclose the first plurality of steps depending upon the first step as the kit model modification routine of Hatanaka receives element modification information and checks all elements that are effected by a modification to the element by observing a "Used list," (see column 9, lines 13-17 and 34-40). Therefore, changes to one element will directly effect changes to another element which, in turn indicates any execution processing upon one element will directly effect processing of another.

In reference to claims 30 and 32, Hatanaka discloses modifying a "kit model" of a three-dimensional CAD system having elements such as points, curved lines and curved surfaces (see column 2, lines 7-18). Hatanaka also discloses identifying a change in an element by receiving modification information for moving or changing an element (see column 2, lines 30-32). Hatanaka discloses the relationship data of being utilized for model regeneration as it is used in supplying a generating method to the model regeneration function (see columns 7-8, lines 66-3). Therefore the limitation of claims 30 and 32, "...creating a first step..." is interpreted as the supplying or creation of a generating method, disclosed by Hatanaka, as the generation method is defined based upon the relationship data. Hatanaka also discloses when points, curved lines and curved surfaces of the model are moved or changed, other graphic elements which relate to the changed element are also modified (see column 7, lines 28-32). Note that the office believes that in using such related elements as in Hatanaka, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change one or more elements to produce a model that accurately reflected the change to a first element because related modified elements would cause other related elements to be changed also. Hatanaka discloses executing modifying

functions contained in the generation relationship data (see column 9, lines 57-67). Hatanaka does not explicitly disclose creating a second step based on the first step and the structure of one of the elements or the relationship between two of the elements however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement a second step creation in the three dimensional modeling apparatus of Hatanaka in order to provide for other related elements to be modified which are based on the modification from the first created step (also, see claim 1 response to arguments above). Hatanaka does not explicitly disclose sorting the steps before execution. Ardoin et al. discloses an object relational management system for use in CAD software, where functions of nodes are ordered according to numeric values equivalent to comparator operators (see column 1, lines 28-31, column 8, lines 34-43 and Figure 16). Neither Hatanaka nor Ardoin et al. disclose sorting the steps to eliminate interference among steps however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the sorting of elemental functions of Ardoin et al. with the modeling system of Hatanaka in order to compute functions of an element in the correct order because changing relationships could cause a change in order of functions thus sorted steps would eliminate the possibility of these changing relationships interfering (see column 8, lines 54-59 of Ardoin et al.) (see Response to Arguments below).

2. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka (U.S. Patent 5,923,573), Ardoin et al. (U.S. Patent 5,692,184) and further in view of Pabon (U.S. Patent 5,251,290).

In reference to claim 29, Hatanaka and Ardoin et al. disclose all of the claim limitations as applied to claim 18, however neither Hatanaka nor Ardoin et al. explicitly disclose verifying

the elements after execution for constraint satisfaction. Pabon discloses a method for geometric modeling where geometric modeling constraints are satisfied (see lines 1-23 of abstract). Although Pabon does not explicitly disclose satisfying constraints for element data it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement verifying constraint data after execution of steps in the modeling system of Hatanaka and object relationship management techniques of Ardoin et al. in order to confirm that the elements are in the correct positions, orientations, and dimensions (see column 1, lines 19-22 of Pabon). Further, the technique of, verifying for constraint satisfaction is well known in the computer art for instance, verifying the necessary amount of disk space available for program installation (Official Notice) (see Response to Arguments below).

3. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka (U.S. Patent 5,923,573) in view of Hollingsworth et al. (U.S. Patent 5,444,836).

In reference to claim 31, Hatanaka discloses a method of propagating changes made in one data element to other related elements (see column 7, lines 28-52). Hatanaka discloses the data structure of elements to include generation relationship data which retains information as to with which and how the geometric shape of elements are generated (see columns 7-8, lines 66-8). Note the office believes the data structure of Hatanaka provides a method for accumulating changes in an element. Hatanaka also discloses using a data network identifying possible sets of changes that may be made to related elements (see column 8, lines 57-67). Hatanaka does not explicitly disclose selecting the most appropriate set of changes by employing some predetermined standard however Hollingsworth et al. does. Hollingsworth et al. discloses methods for creating and applying flexible user defined rules for placement of graphical objects

in a CAD system (see lines 1-3 of abstract). Hollingsworth et al. also discloses a method of selecting rules to apply changes to a model, by determining if the rules pass or fail an overplotting criteria wherein two objects are tested to see if they overplot one another (see column 10, lines 26-30). Hollingsworth et al. discloses selecting a next rule if the current rule would result in the disallowed overplotting according to an OMASK keyword statement (see column 11, lines 31-47). Note the office interprets the OMASK keyword statement equivalent to the predetermined selection standard of applicant's claim. It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the generation of modification steps of Hatanaka with the rule based CAD system of Hollingsworth et al. in order to allow the CAD system to automatically and correctly place the desired graphical objects into desired locations without human intervention (see column 3, lines 30-34 of Hollingsworth et al.).

Response to Arguments

4. Applicant's arguments filed 6/25/2004 have been fully considered but they are not persuasive.

In reference to claims 4, 15 and 18, see pages 8-11 of Applicant's Remarks, applicant argues that the generation relationship data of Hatanaka, "...is merely information regarding the correlation between one graphic element and other graphic elements..." (see pages 8-9, last to 1st paragraphs of Applicant's Remarks) and is not a "step" as claimed. Although the generation relationship data of Hatanaka does retain information on how and to which geometric shapes of the graphic elements are correlated, the office relies upon the fact that the relationship data of Hatanaka is used in a generating method, functioning to create the geometric shapes of graphic

elements (see columns 7-8, lines 66-8). Therefore as stated above, the "first step" is interpreted as corresponding to the creation of a generating method of Hatanaka, the method creating the geometric shapes of the graphic elements based upon relationship data. Therefore, the office interprets Hatanaka to disclose a "first step" as recited in applicant's claims.

Even further, the applicant states that Hatanaka fails to disclose the "second step" recitation of claims 4, 15 and 18 (see pages 9-11 of Applicant's Remarks). The applicant also states that there is no support for the conclusion of obviousness, specifically that, providing a "second step" based on the "first step" and the structure of one of the elements or the relationship between two of the elements would have been inherent. The office further clarifies it's position by providing that Hatanaka discloses that when points, curved lines and curved surfaces of the model are moved or changed, other graphic elements which relate to the changed element are also modified (see column 7, lines 28-52). Hatanaka explicitly discloses the steps of regenerating elements that are related to modified elements based upon their relationship (see column 8, lines 62-67). Applicant's Remarks further state that Hatanaka does suggest multiple steps but, "...does not disclose or suggest what those steps are based on, and certainly does not note that the second step is based in part on the first step," (see page 9, 2nd paragraph of Applicant's Remarks). The office states that if Hatanaka discloses multiple steps and that elements are related and regenerated based upon modification to one element and its relationship to other elements performed in these steps, Hatanaka inherently discloses that these regenerating/redrawing steps are based upon one another since a second regenerating step would regenerate an element found already modified by a first regeneration step. Therefore in view of the above disclosed limitation of Hatanaka, the office interprets the creation of a, "second step"

based on a, "first step" and the structure of one of the elements or on a relationship between two of the elements to be inherent with the model regeneration function of Hatanaka as relationship data is used to supply multiple generation methods which are based on previously modified elements or previous generation methods. Therefore, the office interprets Hatanaka to disclose the "second step" of applicant's claims.

Also, applicant argues in reference to claims 4, 15, 18, 30 and 32, see pages 10-11 of Applicant's Remarks, that Ardoin et al. does not teach the sorting of steps before execution. The office interprets the nodes of Ardoin et al. to be equivalent to steps as they, "can represent a value, an associative evaluation function..." because the associative functions are sorted upon dependency and equivalency relations (see #390 of Figure 16), this sorting, which is equivalent to applicant's sorting of steps (see pages 18-19 of applicant's specification). Even further, the office points to Ardoin, columns 6-7, lines 66-10, wherein Ardoin discloses an example associative function node to contain a line drawing function which updates the geometry of a line, the node having dependencies upon two points. Such a function can be considered as a redraw or regeneration function as disclosed by Hatanaka, defining changes to elements based on other elements. Therefore, the office interprets Ardoin to disclose the sorting step as recited by applicant's claims.

In response to applicant's argument that there is no suggestion to combine the references of Hatanaka and Ardoin (see pages 10-11 of Applicant's Remarks), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of

ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both references, Hatanaka and Ardoin et al. are directed to the exact same art, CAD system modeling techniques. Hatanaka discloses modifying a "kit model" of a three-dimensional CAD system having elements such as points, curved lines and curved surfaces (see column 2, lines 7-18) while Ardoin et al. discloses managing objects in CAD software (see column 1, lines 28-31). In particular to claim 4, Ardoin et al. is utilized to introduce the sorting of nodes or "associative evaluation functions." It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the sorting of elemental functions of Ardoin et al. with the modeling system of Hatanaka in order to compute functions of an element in the correct order because changing relationships could cause a change in order of functions (see column 8, lines 54-59 of Ardoin et al.) which could lead in the modification of displayed elements. Therefore, the sorting techniques of Ardoin et al. are seen to further define and improve the modeling system of Hatanaka, which the office believes provides evidence for a just combination of the references.

In reference to claim 5, applicant argues that Ardoin does not disclose any sorting of steps and therefore does not disclose a depth-first sorting of steps (see page 12, 1st paragraph of Applicant's Remarks). In response to above arguments in view of Ardoin and the interpretation of an associative function node equivalent to a step, the office clarifies that the sorting by applicant, in view of applicant's disclosure of how a depth-first sort is performed (i.e. parent then child, then grandchild, great-grandchild etc.) is equivalent to the sorting method performed in Ardoin et al. Although Ardoin et al. may not explicitly name such a sorting method as a depth-

first sort, the manner in which nodes or steps are sorted is equivalent to applicant's methods (see column 8, lines 34-46). The terms, "functionally equivalent" or "equivalent in functionality" are written to express this equivalency described above. Therefore, the office interprets Ardoin et al. to disclose the depth-first sort of applicant's claim.

In reference to claim 6, see page 12 of Applicant's Remarks, applicant argues that neither Hatanaka nor Ardoin et al. explicitly teach the storing of steps in a step repository. As mentioned above, the office acknowledges Hatanaka's lack of support for such a limitation however, in view of the above arguments directed towards the, "first step," the office believes the, "step repository" of claim 6 to be equivalent to a sort of memory allowing for the save and retrieval of steps in order to execute the steps over again in the future. The generation method of Hatanaka must be stored in some sort of memory in order for the model regeneration function to utilize its data further, which the office interprets as being inherently taught by Hatanaka. Further, all computer processes execute based on some sort of instructional code which is well known in the art to be stored on some sort of medium (Official Notice). Note, the exact naming of the memory or type of memory used for storage is seen to provide no immediate criticality to the application at hand.

In reference to claims 7, 8 and 23, see page 12 of Applicant's Remarks, the applicant asserts that, "...there is no suggestion in the prior art regarding the particular use of a null step as recited in the claims," (see page 12, 3rd paragraph of Applicant's Remarks). The office previously supplied a definition of the term, "null cycle" in response to the applicant's request for evidence that a "nul" step is well known. The definition, as applied to claim 7, shows that the common meaning of a "nul" action is when a processor processes data without introducing any

new data. Applying such an action to claim 7, would indicate that one of the steps of independent claim 4 is a "nul" step. Since the office has showed, and the applicant agrees that "nul" steps are common and do exist in processing data, then implementing a "nul" step in the design modeling methods of applicant's claim would have been obvious. Further, if "nul" steps do exist then there must be motivation to implement them in processing data therefore, the motivation for the applicant to implement a "nul "step in the design modeling methods of the claims might be to allow for the processor to "catch up" with processing current data disallowing new data to be introduced to the processor. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In reference to claims 9 and 17, applicant argues that no prima facie case has been made for the obvious type rejection (see page 13, 2nd paragraph of Applicant's Arguments). As stated, above, neither references explicitly disclose marking changes made to an element however such limitation of marking changes made to an element is obvious as it is well known to mark and keep track of any changes to elements in computer processing. For example, such a limitation can be seen as a flagging technique used to mark elements which have recently changed. Such a flagging technique is well-known in the art of computer processing and therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement

some sort of marking or flagging technique on elements of Hatanaka as such techniques help the processor and/or user identify "special" elements.

In reference to claims 10 and 21, applicant makes similar arguments as applied to claim 4 above so the office applies these to claims 10 and 21 as well.

In reference to claim 25, applicant argues that such a "prediction" as explained in the rejection of claim 25 above, is irrelevant and that, "...it has nothing to do with what the propagation method is doing..." (see page 13, 5th paragraph of Applicant's Remarks). The office points out that claim 25 solely states, "...wherein the plurality of steps is generated by prediction," and nowhere does the claim refer to any propagation method. To clarify the view of the office, a user predicts what the model will look like and the steps are generated based on the user's desired characteristics. Such a term, "prediction" can be interpreted broadly by the office, to mean the prediction of the model by a user as the term, as claimed, is not linked to any sort of processing, software or hardware. Therefore, the office interprets Hatanaka and Ardoin to disclose the limitation of "prediction" of applicant's claim.

In reference to claim 29, see page 14 of Applicant's Remarks, the applicant states Pabon does not disclose or suggest the verification of elements after execution for constraint satisfaction. The office disagrees in that Pabon further discloses that if any new elements are added to the geometric model, Pabon discloses performing constraint verifications by adding the element to a constraint graph (see columns 10-11, lines 59-9 of Pabon). Note, the office interprets the addition of a new element into the model equivalent to the execution of steps of applicant's claims. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining

or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, all three references, Hatanaka, Ardoin et al. and Pabon are directed to the exact same art, CAD system modeling techniques. Hatanaka discloses modifying a "kit model" of a three-dimensional CAD system having elements such as points, curved lines and curved surfaces (see column 2, lines 7-18), Ardoin et al. discloses managing objects in CAD software (see column 1, lines 28-31) while Pabon discloses a system and method of sorting dependencies among elements used in geometric modeling for conceptual design in a CAD system (see lines 1-3 of abstract and title). The fact that all three references are directed to the same exact CAD system genre of graphical programs and improvements in the CAD system programming provides valid motivation to combine the references while it also would have been obvious to one of ordinary skill in the art at the time the invention was made to implement verifying constraint data after execution of steps in the modeling system of Hatanaka and object relationship management techniques of Ardoin et al. in order to confirm that the elements are in the correct positions, orientations, and dimensions thus providing an efficient graphical object modification method and system (see column 1, lines 8-10 and 19-22 of Pabon). Note, such motivation is not taken from the applicant's specification, as the applicant suggests, however is found as one problem solved by the invention of Pabon.

In reference to claim 31, applicant argues that Hollingsworth does not accumulate changes in an object and that Hollingsworth does not indicate that any sort of selection of one set

of changes is being made from among a group of possible changes (see pages 14-15, last-1st paragraphs of Applicant's Remarks). The office states that the data structures of the elements of Hatanaka provide equivalent functionality as the accumulating changes made in one data element of applicant's claim because the generation relationship data of elements retains information as to with which and how the geometric shapes of the elements are generated and also, modifying one element leads to modification of other related elements. Since these relationship data retain this element generation and relationship data even when modification of elements occurs, the office interprets such retaining of information equivalent to the accumulating of applicant's claim. Therefore, the office relies upon Hatanaka to disclose the accumulating changes limitation. Further, the office disagrees with the applicant's opinion that Hollingsworth does not disclose any sort of selection of one set of changes from a group of changes as Hollingsworth et al. discloses selecting a next rule if the current rule would result in the disallowed overplotting according to an OMASK keyword statement (see column 11, lines 31-47). These rules are further defined as placement rules, defining a placement point for a placeable object so that the object will be positioned properly (see column 11, lines 7-11 of Hollingsworth). Surely, such a selecting of a rule from many rules is equivalent to selecting one set of changes from a group of possible changes of applicant's claim. Even further, applicant argues that Hollingsworth does select the next rule after a rule fails (see page 15, 1st paragraph of Applicant's Remarks) however the office disagrees, as Hollingsworth explicitly states that the next rule is tried if a current rule fails (see column 11, lines 31-34 of Hollingsworth). Therefore, the office interprets Hatanaka and Hollingsworth to disclose the limitations of claim 31.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Antonio Caschera whose telephone number is (703) 305-1391. The examiner can normally be reached Monday-Thursday and alternate Fridays between 7:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Bella, can be reached at (703)-308-6829.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Matthew C. Bella

MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

aac

8/23/04